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ABSTRACT

The report describes the development of the final 2 years of an intensive elementary school curriculum for fifth and sixth grade educable mentally retarded (EMR) children, to provide them with an opportunity to achieve their maximum potential for intellectual development, productivity, independence, and psychological well-being. Most of the document consists of appendixes, in which are found sample lessons from the curriculum, content summaries of the curriculum, and descriptions of three experiments that were conducted to establish an empirical basis for the procedures used in three cognitive skill programs within the curriculum (memory strategies, problem-solving, and selective attention). Experiments described concern the facilitative effect of mnemonic strategies on multiple-associate learning in EMR children, choosing the best cognitive training alternative for the EMR child, and language skills prerequisite to relevant-irrelevant discrimination tasks. (DLS)

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FINAL REPORT

Project No. OE 13-443 Hoo38SJ

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A Plan of Action for the Habilitation of the Educable Mentally Retarded Child

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INTRODUCTION

This report describes the completion of research and development begun in the 1960's to design an intensive seven-level training curriculum to provide young educable mentally retarded (EMR) children with an opportunity to achieve their maximum potential for intellectual development, productivity, independence, and psychological well-being. The first four levels of the curriculum, A to D (equivalent to K-3) were published by Fearon Publishers (Ross & Ross, 1974). Negotiations are underway to publish the remaining three levels (E to G).

Final reports under previous contracts have described the work associated with the first five levels (A to E, equivalent to K-4). This report is concerned with the development and research activities associated with preparation of a complete school program for Levels F and G (equivalent to Grades 5 and 6).

With the conclusion of this project we have now achieved our goal of producing a complete K-6 program for the young EMR child. A large-scale formal and controlled evaluation of the curriculum's effectiveness is the logical next step, although such an evaluation lies outside the scope and commitment of the current contract (and in any case should be conducted by someone other than the curriculum developers). However, preliminary research conducted at intervals throughout the 9-1/2 year development period provides strong support for the statement that the curriculum does result in significant major gains in the academic, cognitive, and social behavior of the participating children.

The following is a brief summary of the development and evaluation of the curriculum.

Development and Evaluation Background

In the beginning, short single-subject training programs were prepared for the main subject areas: arithmetic (OEG-4-6-062263-1585); reading, listening, planning, problem solving, associative memory, fine motor skills, music (OEG-0-9-142106-2444[032]), social behavior (OEG-446-068149-1552), and gross motor skills (OEG-4-7-070025-1944).

Each short training program was then evaluated in a formal experiment designed to test the efficacy of its content and procedures as compared to that of the traditional approach to that subject area. In all experiments the experimental groups made significantly greater post-test gains than the control groups. In several experiments the scores of groups of same-age average-IQ children served as an additional basis for evaluating the post-training progress of the experimental groups and in some of these instances the experimental groups either did not differ from or were significantly greater than the average groups, indicating that the EMR children's initial deficit was experiential rather than basic and irremediable.

Having established the efficacy of the approach, content, and procedures used in the short training programs, these programs were then extended to a 10-month school year.

A one-year evaluation of the complete curriculum was then conducted in two primary EMR classes from September, 1970, to June, 1971, with two additional EMR classes as controls using traditional primary curricula (OEG-0-9-142106-2444[032]). The hypothesis that the new curriculum would result in progress significantly greater than that occurring with the traditional curricula for EMR children was strongly confirmed.

The Experimental Group (n=30) made significantly greater post-test progress than the Control Group (n=30), not only in Metropolitan Achievement Test scores (mean gain by the Experimental Group of 20.33 points as compared to a mean gain of 6.50 points for the Control Group, ($t = 5.25$, $p<.0005$) but also in Stanford-Binet Intelligence Test scores (mean IQ gain for the Experimental Group of 11.63 points as compared to a mean gain of 0.40 points for the Control Group, ($t = 6.26$, $p<.0005$).

One (n=15) of the two Experimental Group classes was administered two additional tests as part of that school district's routine testing. A comparison of the pre- and postexperimental scores for that class supported the above results, with the class showing a marked improvement on both the Peabody Picture Vocabulary Test ($t = 4.54$, $p<.0005$) and the Wide Range Achievement Test ($t = 5.85$, $p<.0005$). The Experimental Group also showed marked improvement in a number of areas for which no test data were available: self-confidence, psychological well-being, leadership, willingness to try new activities, social interaction with other children and adults, and general deportment in situations outside the school.

In addition, at the end of the year, seven of the Experimental Group children were able to move out of the EMR classes into normal classes and five moved to educationally handicapped, slow learner, or transitional classes leading to one of these in the following year. By contrast, three children in the Control Group moved to educationally handicapped or transitional classes and none moved into normal classes.

Following the successful one-year testing of the curriculum a preschool year of lessons to teach readiness and other preliminary skills and a second primary year (Levels A and C) were developed (OEG-0-9-142106-2444[607]), and Levels D and E were completed (OEG-0-73-6127).

Under the current contract Levels F and G were completed and three research projects conducted to evaluate the effectiveness of content and procedures of selected programs destined for inclusion in these Levels. The programs evaluated concerned cognitive training in problem solving strategies for choosing the best alternatives, mnemonic strategies in multiple-associate learning, and language skills prerequisite to relevant-irrelevant discrimination tasks. As in all our previous curriculum experiments, the experimental group subjects made significant gains thus justifying the extension of the training programs for inclusion in the curriculum.

Theoretical Background

Although EMR children have the intellectual capacity to learn to read

and write and become independent as adults they often fail to achieve these goals, particularly that of adult independence (c.f. Heber & Dever, 1970).

A crucial reason for the failure of EMR children to achieve their maximum potential is the inadequacy of the existing instructional programs for these children (Heber & Dever, 1970). The curricula are usually simplified versions of those in use for younger normal children. They allot inadequate time to the basic academic skills, offer little or no intensive training in cognitive skills, and allow the children to function passively for much of the school day.

In addition, most curricula make no allowance for these children's special needs and learning difficulties: the children generally lack the academic and attitudinal-motivational readiness characteristic of younger normal children, have inadequate knowledge of common concepts, find discrimination tasks and the manipulation of abstract symbols very difficult, benefit very little from opportunities for incidental learning, and, in addition, have a general expectancy of failure and low self-esteem.

Special class teachers typically make indiscriminate use of non-contingent positive reinforcement, either use no negative reinforcement or use it ineffectively, have low expectancies concerning the children's progress, and rarely specify precise behavioral objectives for the children. Furthermore, the program materials and procedures commonly used rarely incorporate the large body of theoretical formulations and empirical findings available in the psychology and education literature that are highly relevant to the effective instruction of EMR children.

The Ross and Ross curriculum makes systematic use of recent research findings from observational learning (Bandura, 1969), and reinforcement (Bijou, 1970; Weisberg, 1971) theory. Research findings on observational learning have contributed modeling procedures that are used to effect changes in a variety of the children's response patterns. The basic premise underlying this curriculum is that intentional training combined with the systematic use of modeling procedures results in more effective performance than intentional training alone. The rationale for this approach stems from observational learning theory (Bandura, 1969), and mental retardation research (Denny, 1964; D. Ross, 1970a, 1970b, 1971; Ross & Ross, 1973a).

Reinforcement Value of School Setting

Many EMR children are actively unhappy and exhibit negative attitudes towards school as a function of previous failure, derogation concerning special class placement by normal siblings and peers (Hutt & Gibby, 1961), and home backgrounds in which little positive value is attached to school activities (Bernstein, 1960). If EMR children are to profit from special class placement it is essential that positive valuation be attached to school experiences.

As a means of establishing positive valuation, educators frequently

advocate an affective approach, the assumption being that if the teacher is "kind" the child will feel happy about school. In this approach, kindness is generally equated with permissiveness and leniency of demands, inappropriate use of positive reinforcement in which rewards are dispensed regardless of performance, ineffective use of negative reinforcement, and ambiguous and inconsistent standards. That little relationship exists between their accomplishments and praise given by the teacher is apparent to many EMR children. In a series of interviews which we conducted with EMR children, many showed clearly that they were aware of the inequities in the affective approach. For example, one seven-year-old girl said, "Teacher says everyone did good when some kids didn't do no work at all."

In sharp contrast to the affective approach, which attempts to bypass the child's inadequacies and through positive reinforcement create in him a feeling of self-importance and esteem, was the cognitive approach used in the present curriculum. The assumption was that if the child makes significant advances in the academic, motor, and social activities relevant to school success and is aware of his progress positive affect will be a natural outcome. A superstructure of positive affect cannot be imposed on the child in the absence of a solid base of recognizable accomplishment. It was clear from observations made throughout the development of this curriculum that positive affect was generated by this cognitive approach. Furthermore, the affect that occurred served the dual function of attaching positive value to school activities for observers as well as for the subject himself, particularly in the small group situation. Children who experienced reward either directly or through knowledge of their own achievement generally exhibited positive affective responses which typically elicited corresponding reactions of pleasure from other members of the group. Since there were frequent repetitions of this sequence in the small group activities, vicariously aroused affect became conditioned to temporally and spatially contiguous school activities. The efficacy of this vicarious affect was heightened by the fact that the other members of the group knew that the child's (i.e., model) contingencies applied to them as well and in addition perceived the child as similar in ability to themselves (Bandura, 1969).

Concomitant with the emphasis on a cognitive approach was the possibility of a certain amount of failure within the learning situation. The inclusion of failure experiences is in marked contrast to traditional curricula which emphasize protection from failure as one means of preventing further damage to the EMR child's self-esteem. All children experience failure at some time and it is essential that they learn to react appropriately to it. Since no child can be completely protected from all failure experiences at all times, it is unrealistic to omit training in handling failure from the educational program; such an omission does the EMR child an injustice because he will have no appropriate responses in his repertoire when inevitably he is faced with a failure experience.

In the present curriculum, failure had several important functions: it provided information about the type of response that should be made in a specific situation and about reinforcement contingencies in similar

situations, it served as an activating or motivating influence with a consequent improvement in performance, and it allowed the children to experience the satisfaction of winning, since if no one lost, no one won. With the exception of our study (Ross, Ross & Downing, 1973) in which young EMR children quickly learned to use failure as information related to winning and were highly motivated to identify winning responses, others' studies of experimentally induced failure report detrimental effects such as a reduction of effort (Heber, 1964), loss of interest (Denny, 1964), failure set (Zeaman & House, 1962), or increase in expectancy of failure (Rotter, 1954). The children in the curriculum development projects did not exhibit these behaviors. Instead, they became increasingly confident that they could master new material, showed an increase in productivity, and exhibited overt satisfaction and pleasure when tasks that initially resulted in failure were eventually mastered.

The approach used in this curriculum is based on the assumption that the teacher functions most effectively if she has an entire instructional program with every lesson written out in complete detail. Built into the lessons are research tested procedures: the teacher following the lessons is automatically applying up-to-date and pertinent research findings. Providing a complete instructional program allows the teacher to concentrate her energies on the children rather than on lesson preparation, provides continuity of content and training, guarantees the integration of research findings and subject content, and assures maximally effective use of volunteer time. It enables the less skilled teacher to function more effectively and yet also allows the highly skilled and creative teacher to make maximum use of her talents. The procedure of providing detailed lessons and stating precise behavioral objectives for each content area has proven to be far superior to the traditional approach of providing outlines of content accompanied by goals stated only in general terms.

The remainder of this report will include a description of the general procedures used in developing the lessons for Levels F and G, as well as a description of these Levels. Conclusions and recommendations complete this section. Appendix A contains a detailed account of the three experiments. Sample lessons from Levels F and G are provided in Appendix B, and Appendix C lists complete summaries of content for all subjects taught in both Levels.

METHOD

The major part of this three-year project was concerned with the development of programs for Levels F and G. The production process for these Levels can be described in terms of its basic steps as follows:

(1) Review of literature. The literature that was reviewed included reports on elementary school programs for the EMR student, actual EMR elementary school curricula, research investigations on cognitive skills and other performance topics, literature from outside the field that had potential for application, critical reviews of any of the foregoing topics, the journal literature, and the text books and chapters specifying goals, methods, and procedures for the education and habilitation of the EMR child. A review of the literature also required personal contact with special education administrators because many small school districts have produced curricula for the elementary school EMR student that are in mimeographed form and do not appear in any published source. The 1960's were marked by a proliferation of elementary school curricula some of which were initiated by federal support but most of which were supported by state and local school district funding.

(2) Selection of course content. The basic academic, cognitive, and social skills prerequisite to effective functioning and independence were compiled along with the specification of vocational principles to be taught in Level G and the selection of vocational opportunities to be introduced. The procedure used in identifying this set of skills was essentially a task analysis of effective functioning in childhood. The basic question was: What skills are needed for effective functioning in childhood? For the selection of course content for this two-year block of curriculum materials one criterion question was: What skills does an EMR child need to cope with an average day? An example of one such skill is alphabet facility, which refers to the ability to use the alphabet quickly and accurately in dictionary and telephone book searches, sorting name cards, filing, and seeking file information in the library.

(3) Production of teaching units. A teaching unit for a specific topic included a set of lessons written out in detail, dittoed materials to be used in class, homework assignments, and classroom evaluation procedures. Examples of lessons from Levels F and G are contained in Appendix B.

It should be noted that the procedure of writing lessons out in detail used in the Pacemaker Primary Curriculum (Ross & Ross, 1974) and continued through Level G has proven to be highly satisfactory: It allows the teacher to assign to volunteers teaching tasks that do not require his/her supervision and reduces the possibility of a discrepancy between the curriculum experiences designed by the developers and the child's learning experiences. This procedure does not restrict the teacher in terms of lesson methodology: the teacher is encouraged to select the methods that work best for him/her in implementing the curriculum.

(4) Short-term classroom trials. Selected sets of lessons were then evaluated in short-term local classroom trials. Local trials have the

advantage of close contact and maximum teacher input to program developers with minimum effort as, for example, by telephone and discussion. The sets of lessons were tried out by fully qualified and experienced special education teachers, inexperienced teachers, teacher aides, and adult and peer volunteers. To validate the claim that volunteers are able to use this program effectively it was essential that the lesson programs be subjected to use by a heterogeneous group. Information obtained from these trials included reaction to suitability of lesson content, interest value, accuracy of expectations concerning amount of content per lesson, feasibility of homework and seatwork assignments, and motivational value of programs. Feedback sources included teachers, aides, volunteers, parents, the students themselves, and independent observers.

(5) Comprehensive Review and Revisions. On the basis of the foregoing trials the sets of lessons were modified or rewritten, and subjected to further field-testing.

(6) Review Panel. The final products of this development process were subjected to independent reviews by special education teachers. Further revisions and further classroom trials were conducted as necessary.

(7) Final Product. Levels F and G are now completed and ready for long-term (i.e., two-year classroom trial) evaluation by an independent researcher, team, or school system.

In addition to developing sets of lessons for Levels F and G, three research studies were conducted to evaluate two cognitive training programs for Level F and one for Level G. The first Level F study was concerned with associative learning tasks of the kind that require an assembly line worker to link a specific set of objects to a cue object. The purpose of the experiment was to study the relative efficacy of two memory strategies (imagery and rehearsal) on this kind of associative learning. The second Level F study examined the effects of long-term training on the ability to select the best alternative in a social problem situation. The Level G study was concerned with selective attention skills and was designed to test the efficacy of long-term training on the ability to understand and use the language of relevant-irrelevant discrimination. These three studies, all of which have been accepted for publication, are described in detail in Appendix A.

PRODUCTS AND RESULTS

The following is the specific program content for Level F, with number of periods per week in parentheses after each subject: Reading (5), Vocabulary (2), Spelling (3), Writing (3), Arithmetic (5), Science (2), Planning (2), Problem Solving (1), Memory Strategies (2), Selective Attention (1), Listening (1), Vocational Training (2), Social Behavior (3), Independent Seatwork (8), Physical Education (5), Art (2), Music (2), and Friday Fun and Games (1), General seatwork and seatwork for specific subjects were also provided. The total number of lessons was 1428.

The specific program content for Level G was Reading (5), Vocabulary (2), Spelling (2), Writing (2), Arithmetic (5), Science (2), Planning (1), Problem Solving (2), Memory Strategies (1), Information Skills (1), Library Orientation (1), Vocational Training (2), Social Behavior (2), Household Skills (1), Independent Seatwork (8), Physical Education (3), Art (2), Music (2), and Friday Fun and Games (1). General and specific seatwork were provided. The total number of lessons was 1156. Appendix C contains summaries of the content of the above sets of lessons for both Levels F and G.

CONCLUSIONS AND RECOMMENDATIONS

1. The three experiments in this project provide valuable information about the cognitive capabilities of EMR children. It was clear from the experiment on the relative efficacy of imagery and rehearsal for learning multiple associates (see Appendix A) that EMR children lack strategic approaches to associative memory tasks, yet they have the potential to acquire and effectively use such strategies and can generalize their newly-acquired strategies to learning tasks that differ markedly from the initial training situation. These findings have important implications for both school and vocational settings because many tasks in both these settings are essentially associative memory tasks. Also, the successful acquisition of these tasks can result in increased feelings of confidence and positive self-esteem. In the course of developing this training program we surveyed a representative portion of the vocational training literature and found the overall quality unimpressive, although there are a few notable exceptions (see, for example, Brolin, 1976). Generally, there is very little concern in school or post-school vocational training programs with the transmission of skills that would facilitate a variety of job performances. Instead, the training programs are limited to task-specific responses. One implication of this experiment is that with intensive training in memory and other job-related strategies in the early school years the young EMR adult could function far more effectively in the vocational training setting than is ordinarily the case.

2. The experiment on choosing the best alternative in problem-solving situations (see Appendix A) emphasized the important effect of experiential deficits on the performance of the EMR child. EMR children typically lack experience in making choices. They are usually told what to do in the home and school settings and generally do not participate in peer group activities, such as table games, that would provide practice in making choices. Pilot studies for this experiment showed that EMR children were singularly lacking in the ability to make choices and, in fact, often responded quickly to the first alternative without waiting to hear the rest of the alternatives. Selecting the best alternative is of critical importance in taking tests and is of considerable importance in everyday life, particularly in peer group interactions. The fact that this deficit exists in the EMR child and can be modified with relative ease suggests that intensive training in various facets of the decision-making process should be an integral part of the early school program.

3. In this project we had planned to teach EMR children to distinguish between the relevant and irrelevant. The results of the first pilot study were disconcerting: the children were completely unable to cope with the language of relevant-irrelevant tasks. As a result a substantial part of the training program (see Appendix A) focused on the language skills prerequisite to successful performance of relevant-irrelevant discrimination tasks. A comparison of classroom activities in regular and special classes showed that the EMR child typically has less experience than the regular class child with relevant-irrelevant tasks in the school setting. Possibly special class teachers fail to recognize the importance of these tasks and so omit them from the classroom.

program. Whatever the reason, the children had great difficulty with relevant-irrelevant instructions in the early part of the training program. These findings suggest that the selective attention deficit characteristic of the EMR child may be in part a deficit in the prerequisite language skills rather than a deficit in attending per se.

4. An important characteristic of this curriculum is that the lessons are written out in detail, one reason for this procedure is that it enables volunteers and teacher aides to teach the lessons without requiring either supervision or preparation time on the part of the class teacher. Unequivocal support for this claim comes from the fact that in the last 10 years a large group of inexperienced but untrained adults and high school students have taught programs from the curriculum successfully. During the production of Levels F and G a group including housewives, university undergraduates, and high school students taught programs from these two levels with considerable success, the criteria of success being post-test results in some cases and classroom teacher and parent reports in others. One implication of these results is that teachers who can recruit volunteer help can make optimal use of such assistance with minimum output of supervisory time.

The procedure of having all lessons written out in detail for the teachers, with behavioral objectives for the subject area stated precisely, should be followed in special classes. This procedure is far superior to the traditional approach of providing outlines of content accompanied by educational goals stated only in general terms. It enables the less skilled teacher to function more effectively and yet also allows the highly skilled and creative teacher to make maximum use of her talents. It is possible that the large-scale attempts to upgrade the academic performance of culturally deprived and under-achieving children have generally failed to produce results because the teachers were not provided with complete detailed sets of all lessons. Most teachers lack the time and training to prepare an effective course of study from even a good course outline.

5. A number of EMR children started at Level A of the curriculum at school entry and progressed through several levels before moving into a higher educational placement category. These children made marked academic, cognitive, and social gains that astonished their teachers and parents. We strongly recommend that a formal evaluation of the entire curriculum be made by an independent research team. Ideally, such an evaluation would be a longitudinal one in which a group of EMR children of low potential learning status would begin at Level A and move through the entire program to Level F. We recommend a group having low potential learning status because a more able EMR group would be likely to be reassigned to a higher educational placement category after two or three years in this curriculum program.

6. Many EMR children have benefited markedly from the cognitive skill and vocabulary training provided in the curriculum. Their success suggests that other groups of children could also benefit from some of the programs in the curriculum. It is our opinion that culturally deprived children who are functioning below their apparent potential and slow learners would also benefit from these training programs. It would

be exceedingly interesting to apply this curriculum framework with its areas of emphasis and philosophy to more advanced content appropriate for children in the regular elementary grades. Like the retarded children, these children often fail to reach their potential; although this failure is less apparent since the children generally do perform adequately, it is nonetheless a significant loss both to the children and society.

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*These references are studies, reports, and films produced in conjunction with the development of the curriculum.

APPENDIX A

The Experiments

Facilitative effect of mnemonic strategies on multiple-associate learning in EMR children.

Cognitive training for the EMR child: Choosing the best alternative.

Cognitive training for the EMR child: Language skills prerequisite to relevant-irrelevant discrimination tasks.

Facilitative effect of mnemonic strategies on multiple-associate learning in educable mentally retarded (EMR) children[1]

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Abstract

The purpose was to determine the efficacy of mnemonic strategy training for multiple-associate learning. Following pretraining measures of multiple-associate learning and general memory skills, 33 young educable mentally retarded children were randomly assigned to one of 3 conditions: imagery, rote repetition, or control. Each group participated in a story and game program for 5 hours over a 2-week period, which, depending on condition, involved intensive training in the use of imagery, or rote repetition, or no direct mnemonic training. Posttraining measures showed marked improvement with mnemonic training, with imagery being superior ($p<.01$) to rote repetition.

There is unequivocal evidence that the acquisition of paired-associates by young educable mentally retarded (EMR) children can be markedly facilitated through short-term (Taylor, Josberger, & Knowlton, 1972) and long-term (Ross, Ross, & Downing, 1973) training in the use of sentential links. However, when more complex associative learning tasks are used as, for example, a multiple-associate task, sentential links become difficult to use because young EMR children generally are unable to organize more than one noun per pair into a sentence. The sentences they generate commonly link the stimulus noun and one response noun in a predicative relationship with additional response nouns being incorporated into the base sentence by means of conjunctions, for example, the TRAIN ran over the PEACH and the GUITAR and the SOAP. Such a verbal context often facilitates the association of the stimulus item and the first response item, that is TRAIN-PEACH, but the overall effect is to impair rather than enhance multiple-associate performance. Tests conducted prior to this experiment showed that EMR primary grade children generally performed better on a multiple-associate task presented pictorially when left to their own resources than when instructed in the use of a sentential link strategy (Ross, 1974).

Although there is a paucity of research with EMR children on the efficacy of mediational strategies for multiple-associate learning tasks, there is some evidence from studies of short-term training that imagery, verbal elaboration, and, to a lesser degree, rote repetition, can facilitate the acquisition of multiple-associates. In a study of EMR elementary grade children Taylor, Josberger, and Knowlton (1972) reported that instructions to elaborate in the form of either images or verbal contexts resulted in better acquisition of multiple-associates than did rote repetition. The task used by Taylor et al. was easier than that used by Ross (1974): the items were triplets (one stimulus noun and two response nouns), whereas those used by Ross were quartets (one stimulus picture and three response pictures). Also, the subjects in the Taylor et al. study were older. Bender and Taylor (1973) demonstrated the efficacy of imagery-based elaborative sentences for facilitating recognition of associative groupings by EMR junior high school children.

The purpose of the present study was to compare the relative efficacy of long-term training in the use of imagery and rote repetition strategies for the acquisition by EMR primary grade children of noun quartets presented pictorially. It was predicted that both imagery and rote repetition strategies would facilitate acquisition, with greater proficiency occurring with imagery than with repetition. The rationale for the latter prediction was that associative learning can be markedly facilitated if the subject establishes a relationship among the items to be remembered (Asch, 1969). With an appropriate instructional set imagery can virtually guarantee such a relationship if the subject is required to visualize an interaction among the multiple units of each item (Bower, 1972). By contrast, rote repetition should be less effective because it results in temporal contiguity of the units but is unlikely to establish any relationship other than contiguity. Empirical support for the superiority of imagery is contained in the Taylor, Josberger, and Knowlton (1972) finding that with short-term training imagery

resulted in greater facilitation of multiple-associate learning than did rote repetition. Further, there is evidence with children of average intelligence that imagery facilitates the acquisition of multiple-associates to a greater degree than rote repetition. Taylor, Josberger, and Prentice (1970) trained sixth-grade children to use either imagery or rote repetition to learn noun quartets. Subjects in the imagery condition recalled almost four times as many nouns as did subjects who had used a rote repetition strategy. Imagery also resulted in an increase in the number of sets from which nouns were recalled. Danner and Taylor (1973) have also demonstrated the efficacy of imagery training for the acquisition of multiple-associates in elementary school children.

Method

Subjects. The subjects were 33 EMR children (boys = 18, girls = 15) in four primary special classes. All subjects were free of gross motor, sensory, and emotional defects and had been given the Stanford-Binet Intelligence Test Form L-M in the 11 months prior to this study. The subjects were assigned randomly to the Imagery (n = 11), Rote Repetition (n = 11), and Control (n = 11) groups. Statistical tests showed that the groups did not differ in chronological age (CA), mental age (MA), IQ, sex, socio-economic status, years in school, or racial origin. Table 1 contains the descriptive statistics for the three groups.

TABLE 1

CA, MA, and IQ for the Imagery, Rote Repetition, and Control Groups

	CA (months)			MA (months)			IQ		
Group[a]	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Imagery	102.10	9.53	84-115	66.73	8.55	57-81	65.73	8.48	54-78
Rote Repetition	106.18	11.91	77-118	70.64	11.15	44-86	66.27	5.93	57-73
Control	97.73	14.99	85-122	66.82	13.42	51-94	68.36	8.43	52-78

[a]There were 11 subjects in each group.

Test Material. Two picture sets (A and B) of seven quartets each were used to obtain the pre- and posttraining measures. The quartets of nominally unrelated items were 5.08 x 7.62 cm colored pictures of familiar objects, for example, a pumpkin, rabbit, house, and book, a car, pig, queen, and blocks. The quartets were constituted on the basis of low associative connection on the Palermo and Jenkins (1964) norms and minimal intralist interference. Prior to the experiment each subject was presented with the 56 pictures in the two sets, along with foils, to ensure that he could name the pictures.

Two additional pretraining measures of memory skill were used to establish the initial equality of the three groups. One was a memory

for stories test similar to the item at Year VIII of the Stanford-Binet and the other was a memory for objects test that used a format similar to but more difficult than the item at Year IV on the Stanford-Binet.

Test Procedure. The subjects were tested individually in an experimental room. In addition to the test administrator two trained observers were present to record all responses to the associative learning task including self-instruction, rehearsal, and other comments. The observers had no part in the training and were naive as to the experimental status of the subjects.

For the memory for stories item the tester said, "Listen, I am going to read you a story and I want you to listen carefully because at the end I am going to ask you questions about what happened." The tester read the story once and then asked questions about it. The maximum possible score was 12 points. The groups did not differ on this measure: the means were 5.82 (Imagery), 6.27 (Rote Repetition), and 5.91 (Control).

For the memory for objects item the tester said, "Watch me. I am going to put some things on this card. I will give you a little time to look at them then I will cover them up with this box. I will ask you to tell me all the things that are under the box." The tester then gave three items each, with four small attractive objects, the maximum possible score being 12 points. The groups did not differ on this measure: the means were 4.09 (Imagery), 4.27 (Rote Repetition), and 4.56 (Control).

In the multiple-associate learning task the tester first used four small objects (one stimulus object and three response objects) to demonstrate the task presentation procedure. When the subject had demonstrated understanding with three practice sets of objects, the tester repeated the process with picture sets similar to those to be used in the multiple-associate test situation. The procedure to be followed in the remaining part of the test session was described and the subject was given an opportunity to ask questions.

The multiple-associate task procedure consisted of a 5-second anticipation interval in which the stimulus picture was presented, followed by a 20-second simultaneous presentation of the stimulus picture and the three response pictures, and then a 10-second interset interval. The subjects observed each of the seven sets once without being required to respond (Exposure Trial). Immediately following the Exposure Trial the Test Trial occurred: the subject was shown each stimulus picture (now in a different order) followed by a 20-second recall period during which he responded verbally. The order of presentation of Sets A and B was counterbalanced, with half of the subjects in each condition having Set A for the pretraining measure and Set B for the posttraining measure and the other half having the reverse order. The dependent variable was the total number of response pictures recalled in the Test Trial (maximum = 21).

Pretraining Inquiry. Immediately following the Test Trial, the tester showed the subject the stimulus picture of each of the seven sets in order of correct anticipation and asked him to describe how he had remembered the pictures that went with the stimulus pictures. All

responses were recorded. The subjects' descriptions of how they had remembered were subsequently categorized as imagery if the subject reported thinking of a picture containing the response pictures, as repetition if he reported a rehearsal technique, and as nonmediated if the subject did not state how he had remembered or if he reported "looking hard", "trying hard", or guessing.

Experimental Conditions. In each of the three conditions the experimenter read stories and played games with small groups of subjects for five 30-minute periods a week for two weeks. The subjects were given tallies on score cards for winning games and then chose a tangible reward for each completed score card. The groups did not differ on number of prizes won during the training period. The procedures specific to each condition are described below.

Imagery Condition. The experimenter used stories and related table games to teach the imagery strategies. The stories all had the following characteristics: The child depicted used imagery to remember sets of objects or events. He was highly motivated for a plausible reason to remember two or more objects or events that went together. He thought about a way a picture suddenly appears on television when the set was turned on. He pretended that he was turning the set on and the instant the picture appeared he saw the objects to be remembered in the picture. He then told his friend (or sibling or parent) what was happening in the television picture. Later, he told his mother or some other adult how thinking of a picture with the objects in it had helped him to remember. The story adult then praised him or showed approval about the imagery procedure. Each story was followed by questions, discussions of the memory strategy, and a game designed to provide further practice in the use of imagery. The following story was one of those used in the imagery training:

Sandra's class was playing Take a Picture. In this game the teacher gave each child three pictures to look at and remember. She gave Sandra pictures of a cake, a mouse, and a chair, and she gave Anne pictures of a boat, a seagull, and a boy. As soon as the children had looked at their pictures the teacher took them away. When she held up one of Sandra's pictures, like mouse, then Sandra had to say the other pictures that went with mouse which were chair and cake. If Sandra could remember the pictures she got a toekn and some new pictures to remember. The first child to get three tokens won the game.

Sandra tried hard to think of a way to remember that cake, mouse, and chair went together. Then she said to herself, "I think I'll put them all in a picture like on television. I'll pretend I'm turning on the TV and the minute the picture comes on it will have the cake and the mouse and the chair in it." Sandra pretended to turn on the TV and there was a picture with a mouse hiding under a chair eating a piece of cake. Sandra thought about the picture, she could imagine how hungry that mouse was! Just then the teacher looked at Sandra and held up a picture of a chair, and quick as anything Sandra said, "Cake and mouse."

"Good work, Sandra!" said her teacher. "You didn't have to stop for

a minute to think of the pictures that went with chair. Can you tell us how you remembered so quickly?"

Questions:

1. What did Sandra tell her teacher about how she remembered?

2. Anne's pictures were of a boat, seagull, and boy. How could she remember them?

3. Sandra's new pictures were woodpecker, tree, and candy. How could she remember to say tree and candy when her teacher showed her a picture of a woodpecker?

Game: Play Take a Picture using some high-level associates including cake, candle, and birthday presents, as well as some pictures that do not elicit immediate associations, such as tree, elastic, and bottle. Emphasize putting the individual pictures into a television picture, the immediacy of the picture, and having the objects to be remembered in some kind of interaction.

Some training sessions involved card and word games not directly related to the story content. In the games the subject was first helped to generate images, next instructed to generate his own images, and finally participated without imagery instructions but was praised and rewarded if he reported the use of imagery.

Rote Repetition Condition. The use of rote repetition to remember a series of objects or events was taught using the same general procedures described above. However, the stories and games were changed so that rote repetition was required. A rhythmic type of rote repetition was emphasized.

Control Condition. The subjects participated in a story and game program in which the variety and number of games and stories were similar to those of the other two conditions. No training in mnemonic strategies was involved. The main reason for having the Control group participate actively was to ensure that they had equal time in experimenter contact; familiarity with pictures, objects, and games; equal reward during the sessions; and equal motivation effects from being taken out to the experimental room.

Posttraining Measures. Three days after the two-week training program the pretraining measure of multiple-associate learning was repeated and was followed immediately by a posttesting inquiry. Two to five months later all available subjects in the two Experimental conditions participated in two-person memory card games in classroom settings as a check on retention of strategies learned in the experimental period. There was no prompting of mnemonic strategy. The subjects were observed for evidence of use of imagery (during the training the subjects in imagery closed their eyes while they thought of a picture) and rote repetition (rhythmic overt or semi-covert verbalization). After playing the game three times the subjects were asked to show a peer how to play the game.

Results

Prior to training there were no differences in multiple-associate learning among the three groups (F 1.29, dfs 2/30). Analysis of covariance on the posttraining means adjusted for differences in the pretraining means showed that the groups did differ with multiple-associate learning improving as a function of training in imagery and rote repetition strategies. This analysis is contained in Table 2.

TABLE 2

Pretraining, posttraining, and posttraining adjusted means for total number of picture items (maximum = 21) recalled in the Test Trial

Group	Pretraining Mean	Posttraining Mean	Posttraining Adjusted Mean	F (2/29 dfs)
Image	5.82	12.46	12.20	15.53*
Repetition	5.36	9.18	9.25	
Control	5.18	6.09	6.28	

*p<.01

Following the recommendation of Glass, Peckham, and Saunders (1971) the level of significance of the analysis of covariance was reported at the .01 level. Pairwise comparisons confirmed the predictions that imagery would prove superior to rote repetition ($t = 2.79$, $p<.01$) and control ($t = 5.57$, $p<.001$) and rote repetition would be superior to control ($t = 2.80$, $p<.01$).

In the pretraining inquiry the reported strategie for remembering were repetition in the form of rapid rehearsal (n = 9), and nonmediated (n = 24) strategies. In the posttraining inquiry all subjects in the Imagery (n = 11) and Rote Repetition (n = 11) conditions reported using the strategies they had learned. Of the 11 subjects in the Control condition 4 reported rapid rehearsal and the remaining 7 reported the following nonmediated strategies: looking hard, trying, thinking hard, and guessing.

A follow-up situational test in the form of a two-person memory card game given two to five months after the end of the experiment to all available subjects in Imagery (n = 7) and Rote Repetition (n = 9) showed that six of the seven Imagery subjects and seven of the nine Rote Repetition subjects used the strategies that they had previously learned and spontaneously advocated the use of these strategies when these subjects taught a peer how to play the game.

Discussion

EMR children who had been given long-term training in the use of

imagery and rote repetition showed retention and transfer of their newly-acquired skills, with a consequent marked facilitation of multiple-associate learning. The demonstration of retention and transfer of mnemonic training was consistent with previous research with EMR children on paired-associate learning (Ross & Ross, 1973; Ross, Ross, & Downing, 1973). This finding is noteworthy for the stringency of the tests of transfer used in this and the previous studies. In the present study the subjects were tested three days after the completion of training by a new experimenter, in a different setting from that used in the training, and with a multiple-associate test task that differed markedly from the training procedure tasks. No prompting of mnemonic strategy was allowed and every effort was made to disassociate the test task from the training situation. Further evidence of the efficacy of this long-term training is provided by the fact that a follow-up situational test administered from two to five months later on all available experimental condition subjects (Imagery = 7, Rote Repetition = 9) showed retention of strategy in both groups. Indeed, several subjects in each group spontaneously reported the successful use of the mnemonic strategies in memory games played at home. These results suggest that the potential is great for improving academic performance in the EMR child with mnemonic training and are consistent with the recommendations that young children of normal (Bower, 1973) and subnormal (Spitz, 1966) intelligence be routinely taught to use mnemonic strategies to facilitate acquisition of the associative learning tasks of the early school years. The results obtained here discount Jensen's (1970) suggestion that the education of the EMR child should be limited to tasks which do not require conceptual abilities such as mnemonic elaboration.

The subjects exhibited mastery of the imagery strategy early in the training period, a finding that we attribute in part to the power of the instructional set. Having the subject pretend that when he turned the television on a picture appeared depicting the objects to be associated in interaction proved to be a highly effective procedure for transmitting the concept of imagery to these EMR children. One important advantage of this procedure is that the child can use it at any time. Other methods that have proven successful in training imagery production in young children, such as generating an imaginal interaction by playing with objects or drawing pictures of them (Danner & Taylor, 1973; Varley, Levin, Severson, & Wolff, 1974) lack this characteristic of immediate availability.

The superiority of imagery over rote repetition is consistent with research on EMR children (Taylor, Josberger, & Knowlton, 1972) and children of average intelligence (Taylor, Josberger, & Prentice, 1970). Imagery, like verbal elaboration, can function as a relational-organizer (Bower, 1972) and thus facilitate associative learning (Asch, 1969). It is likely that the superiority of imagery over rote repetition was in part a function of the use of pictorial presentation of the associative learning task. Pictorial presentation favors an imagery strategy (Levin, Horvitz, & Kaplan, 1971) whereas a verbal presentation might have favored rote repetition and thus minimized the test performance differences between the two strategies.

The efficacy of rote repetition tends to be discounted in the mediation literature partly because this procedure is frequently used in verbal learning research as a means of preventing control subjects from engaging in uncontrolled mediational activity. In fact, rote repetition with a rhythmic emphasis is a practical and relevant mnemonic strategy for tasks such as serial memory tasks (Turnbull, 1974) and digit span (a Level I task in Jensen's [1970] theory) and should be an integral part of any mnemonic training program used in the school situation.

An interesting question concerns the order of components in the use of an imagery strategy. Does the young EMR child first visualize an interactive scene and then verbalize events depicted in the scene? Or is the associative interaction among the objects first covertly verbalized and then described as a picture based on this verbal code? Two bits of evidence support the imagery→ verbalization order. Tests conducted prior to the experiment showed that typically young EMR children of the same age as the subjects were unable to generate effective sentential links for organizing multiple-associates (Ross, 1974). Generally their sentences described a predicative relationship between the stimulus item and one response item, the remaining response items being weakly linked to the sentence with conjunctions. In contrast, the subjects' responses to the posttesting inquiry described high caliber interactive scenes in which all the response items played an integral part. The ease with which the subjects generated these interactive scenes (both in the training and test situations) suggests an imagery process rather than a sentence generation process. Furthermore, the subjects almost invariably described the pictures they generated in the present tense, whereas in studies of subject-generated sentential links (Ross & Ross, 1973; Ross, Ross, & Downing, 1973) the past tense has predominated. Taylor, Josberger, and Knowlton (1972) reported similar findings concerning imagery/present tense and sentential links/past tense in the paired-associate learning of EMR children.

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Cognitive training for the educable mentally retarded child: Choosing the best alternative[1]

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Abstract

Twenty-eight educable mentally retarded (EMR) children participated in an 8-week training program on choosing the best alternative. The training was presented within the context of small-group discussions of familiar social problems and table games. A Control group (n=28) participated in similar activities but without specific cognitive training. The Experimental group's posttest scores were far superior ($p<.001$) to those of the Control group, a finding which suggests a major experiential component in the deficit in problem-solving skills typical of the EMR child and provides strong support for the efficacy of early intensive cognitive training.

Introduction

Research on problem-solving processes can be grouped into studies in which the task is to generate a solution on the basis of information that is provided and those which involve selecting the best from several supplied alternatives. Considerable research and educational effort has been expended on both aspects of this generate-supplied dichotomy in children of average and above-average intelligence (see, for example, Kagan & Kogan, 1970; Rohwer, 1970). In contrast, the studies on mentally retarded children are relatively few and mainly have been limited to the generate aspect despite the critical importance of evaluation skills in successful problem-solving. Studies representative of the generate group with EMR children include those of Spitz and Nadler (1974) on logical problem-solving, Goodstein and his associates (Goodstein, Cawley, Gordon, & Helfgott, 1971; Goodstein, Bessant, Thibodeau, Vitello, & Vlahakos, 1972) on the effect of extraneous information on verbal problem-solving, and Ross and Ross (1973, 1974) on social situational problem-solving.

In the latter studies Ross and Ross showed that young EMR children could learn to generate clusters of alternative solutions to a stated problem. The purpose of the present study was to carry this training one step further by demonstrating that these children are capable of proceeding to the next level, which involves the evaluation of several alternatives that are supplied and identification of the best one. It was hypothesized that with training this cognitive skill could be improved in young EMR children, the rationale being that the deficiency of EMR children in these skills is largely experiential: The typical child is rarely given the opportunity to acquire and practice evaluation skills at home and school although many situations occur daily requiring the evaluation of alternatives.

Method

Subjects. The subjects were 56 EMR children (M=31, F=25) in six special classes in Northern California. All subjects were free of gross motor, sensory, and emotional defects. They were randomly assigned to Experimental (n=28) and Control (n=28) conditions. Between-group comparisons showed that the groups did not differ on MA, IQ, years in school, or racial origin, but did differ on CA, with the Control group being younger ($p<.05$) than the Experimental group.

TABLE 1

Descriptive statistics for the two groups

Group	N	CA (months)			MA (months)			IQ		
		Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Exp	28	133.89	20.39	88-162	81.57	15.35	45-109	60.93	7.37	47-71
Con	28	120.43	22.79	77-154	75.61	15.28	46-108	63.04	7.32	45-74

Test materials. Two matched sets of 30 items each (Forms A and B) were used to obtain the pre- and posttraining measures of ability to choose the best alternative. Each item described a familiar social or environmental problem confronting a child and requiring some action or decision on his part. The subject was required to choose one of three courses of action and state why the alternative selected was a good choice. The following test items are from Form B:

Jill was going to a Halloween party and she did not want anyone to know who she was. Which would be the best thing for her to use to dress up so that no one would know who she was - (a) a swimsuit with a funny looking swim cap, (b) or her brother's winter coat, (c) or one of the white sheets off her bed? Why?_____

Cathy was all alone in the house. She looked out her window and saw a man who might be a burglar climbing into the window of the house next door and she knew that the family who lived there were all out at a party. What would be the best thing for her to do - (a) telephone the police, (b) or run out on the street and see if she could see a policeman, (c) or call, "Help, help, there might be a burglar"? Why?_____

The test was divided into two parts of 15 items each and was individually administered on consecutive days. Two practice items were given at the beginning of the first testing session and one at the beginning of the second session. Once testing started, the test administrator was instructed to repeat an item once if the subject did not respond, the reason being that with the verbal presentation used here the subject did not have continuous exposure to the alternatives and thus might forget them. The test yielded Quantitative and Qualitative scores with a maximum for each of 55 points. The Quantitative score was based on selection of the alternative, with two points for each correct choice, or one point if an incorrect alternative was accompanied and justified by a logical supportive reason. The Qualitative score was based on the quality of the reason given, with two points for a superior statement and one point for an adequate one. There were five items on which the maximum score in each category was one point. Scoring criteria for the Qualitative score were set up by two psychologists who then together scored the tests using these criteria. A third psychologist then independently rescored the tests using the same criteria. Inter-rater reliability was .99 for the Quantitative scoring, with disagreements stemming from decisions concerning the adequacy of reasons supporting weak alternatives, and .95 for the Qualitative scoring.

Training program. The Experimental subjects participated in groups of four or five in a training program conducted within the context of discussion groups and requiring 40 twenty-minute sessions. Individual score cards were used with subjects earning tallies for good answers or for trying hard, and then receiving small tangible rewards as cards were filled. Topics discussed included the concept of choice, distinction between a choice and an order, bases for choosing one of several attractive alternatives (liking/disliking, need, time limitations, feasibility, and having the skills or equipment), bases for choosing one of several unattractive alternatives, choices in emergency situations, and choices based on logic. Choice in game situations was taught within the context of Twenty-One and Tic-Tac-Toe, with additional practice provided by having lunch-hour Round Robin competitions using these games.

The Control group spent an equal amount of time in discussion groups and game activities stimilar in attractiveness (and under similar conditions of reinforcement) to those used with the Experimental group but offering no training in making choices.

Posttraining measures. When the Experimental group had completed the training program both groups were again administered the tests used in the pretraining measure. In both pre- and posttraining sessions the test administrators were naive as to the experimental status of the subjects.

Results and Discussion

The results provide strong confirmation of the efficacy of training in the evaluative skills basic to successful choice behavior. It can be seen from Table 2 that the Experimental group showed greater proficiency in selecting the best alternatives (Quantitative Score) and in providing support for their choices (Qualitative Score). Further evidence of the efficacy of the program came from the Twenty-One and Tic-Tac-Toe competitions in which the best EMR players consistently defeated same-age peers of average intelligence.

TABLE 2

Pretraining, posttraining, and adjusted posttraining means for total test scores and subscores

Group	Score	Pretrain	Posttrain	Adjusted posttrain	F (dfs 1/53)
Exp	Total test	61.71	71.29	70.59	17.98*
Con		60.18	57.86	58.54	
Exp	Quantitative	38.36	43.14	42.76	19.25*
Con		37.43	36.04	36.42	
Exp	Qualitative	23.36	28.14	27.87	11.08*
Con		22.75	21.82	22.09	

*$p<.001$

Behavior during pretesting was characterized for both groups by marked variability in decision time, with some subjects pondering at length the alternatives for all problems and others consistently accepting the first alternative with only momentary consideration after having been required to listen to the remaining alternatives. However on the posttests, the Experimental group (but not the Control) exhibited a marked reduction in both variability and length of decision time, despite the fact that the multiple choice test format was quite different from the group discussion training procedure. This change in pattern of response behavior suggests that both the rapid and delayed response patterns exhibited during pretesting were a result of inexperience with choice situations per se rather than of true impulsivity and reflectivity.

The fact that this program required 40 training sessions is an indication of how difficult the acquisition of evaluation skills is for the EMR child. However, the long-term social benefits for the child more than justify time spent on training. The ability to select the best alternative is an important prerequisite to the successful socialization of any child. It is of critical importance for the EMR child, who typically is less able at reasoning than is the child of average intelligence and, consequently, can be more easily induced to accept unfair agreements, take unreasonable chances, and engage in deviant or illegal acts.

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Cognitive training for the EMR child: Language skills prerequisite to relevant-irrelevant discriminations tasks

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Abstract

The purpose was to determine the efficacy of a six-week training program for teaching educable mentally retarded (EMR) children the language skills prerequisite to distinguishing between the relevant and irrelevant features of a task. For 100 minutes each week the Experimental subjects (n=20) were given practice with the instructions used in relevant-irrelevant discrimination tasks within a story and game context. Control subjects (n=20) also participated in story and game activities, but with no training in relevant-irrelevant discrimination instructions and tasks. The Experimental group showed marked gains ($p<.01$) on the posttests and there was subjective evidence of transfer to other classroom and playground activities.

One of the major determinants of the impaired performance characteristic of the educable mentally retarded (EMR) child is an attention deficit. Effective development of procedures to remedy this deficit is dependent on recognizing that both temporal and selective components contribute to it. The temporal component involves difficulty in responding consistently and, as such, is an attention-span problem. The selective component involves difficulty in attending to the relevant and/or salient features of the environment with a concomitant decrease of attention to irrelevant features, that is, an information-processing problem. In the developmental process, the acquisition of temporal attention skills precedes the growth of skill in selective attention (Kagan & Kogan, 1970).

Having demonstrated that the temporal attention deficit in EMR children can be markedly improved with training (Ross & Ross, 1972, 1974) the present study was the first of a series designed to develop selective attention skills in these children. The basic strategy used was subskill training: the rationale for this approach was that the acquisition of the component behaviors prerequisite to selective attending is of critical importance for the development of proficiency in this complex cognitive skill. The component behavior focused upon here was the ability to understand the instructions that are commonly used in presenting relevant-irrelevant discrimination tasks. The criterion of understanding was accuracy of response, that is, the ability to correctly identify the elements of the task situation that should be the focus of attention, as opposed to selective attention, per se, that is the ability to attend only to a specific feature of the environment to the exclusion of others. The training was presented within the context of stories, group discussions and table games. It was hypothesized that with long-term training EMR children would show marked improvement in this subskill of selective attention.

Method

Subjects. The subjects were 40 children (boys=19, girls=21) in three elementary special classes for educable mentally retarded and slow learners. They were assigned randomly to the Experimental (n=20) and Control (n=20) groups. The groups did not differ in chronological age, mental age, IQ on the Stanford-Binet Intelligence Test Form L-M, sex, racial origin, or years in school. The descriptive statistics for the two groups are contained in Table 1.

TABLE 1

CA, MA, and IQ for the Experimental and Control Groups[1]

Group[2]	CA (months) Mean	CA (months) SD	CA (months) Range	MA (months) Mean	MA (months) SD	MA (months) Range	IQ Mean	IQ SD	IQ Range
Experimental	99.90	13.43	70-122	68.05	10.68	48-69	65.60	13.07	46-80
Control	100.50	15.28	68-122	64.19	11.55	51-73	62.85	7.48	51-77

[1]As a single descriptive term, "EMR" best fits this sample: of the 40 subjects, 35 had IQ scores below 72.

[2]There were 20 subjects in each group.

Test Material and Procedure. Two parallel forms (A and B) of 15 items each were used to obtain the pre- and posttraining measures of ability to identify the relevant and irrelevant. The test items were designed to assess the subject's ability to generate relevant verbal information about a topic, identify information irrelevant to a topic, and select from sets of tangible objects those that were relevant or irrelevant to a proposed project. Every effort was made to equalize the two forms in terms of wording, item format, familiarity of situations and objects, and order of different types of items. Two sets of subjects achieved almost identical scores on the two forms. The EMR Control group (n=20) were given the two forms in counterbalanced order with a six-week interval between test administrations. Their pre- and post-means were 13.88 (Form A) and 14.29 (Form B). A group of kindergarten and first grade children (n=25) of average intelligence obtained mean scores of 31.40 (Form A) and 32.15 (Form B) with a one-week interval between test administrations. Further analysis of the two sets of scores showed a high degree of consistency for scores on visual and verbal mode subsets of items.

Five of the items on each test required verbal answers and the remaining 10 items were ones that required the subject to select one or more tangible objects from a group of objects. Total possible score was 35 points. The following are examples of the test items:

"The teacher tells Susan to pick out the things she needs for crayoning. Put the things that Susan picks on this card." (Child must choose from crayons, paper, axe, mirror, and lemon.) Two-point item.

"Sandra is playing Cowboys and Indians. Her friend, Betty, says that Sandra has one thing that does not belong in Cowboys and Indians. Put the thing that does not go with Cowboys and Indians on this card." (Child must choose from Indian, Cowboy on a horse, horse, tree, girl's flower bracelet.) One-point item.

"See all these things?" (Point to objects on table.) Some of these things do not belong in a toy store. Put the things that do not belong in a toy store on this card." (Child must choose from a boy doll, bear, game, toy boat, prescription medicine bottle, and a large Band-Aid.) Two-point item.

"The children in Room 3 are going to have a hot dog sale. Ted has to go around to the other classes to tell them about it. What are three things he should tell them about the hot dog sale?" Three-point item.

The subjects were tested individually in an experimental room with half the subjects in each group having Form A on the pretest and Form B on the post-test and the other half having the reverse order. The test administrators had no part in the training program and were naive as to the experimental status of the subjects.

Experimental Condition. All subjects worked in small groups with the experimenter for five 20-minute periods a week for six weeks. The subjects were given tallies on score cards for good answers and for

trying hard and then, for each completed score card, chose a tangible reward. The small group training context allowed frequent participation, peer modeling (Bandura, 1969), and sufficient repetition to facilitate acquisition, and by virtue of the physical arrangement it was also attention-directing. A variety of interesting story and game activities coupled with positive social and tangible reinforcement served to further enhance attention. Previous research has demonstrated the efficacy of this general teaching procedure with young EMR children (Ross & Ross, 1974).

The task was to learn the vocabulary associated first with relevance and then with irrelevance. The subjects were taught what was meant when they were asked questions in these forms: Which things do you need for..., belong with..., are good for..., which of these is a...

To teach the vocabulary of relevance, short stories followed by questions using the above phrases were read and discussed, and games using the same language were played. The following are examples of the stories and games used:

"Karen is making a picture book about animals. The only pictures she wants in her book are animal pictures. First she put in a picture of a horse, then she found a picture of a cow. What other pictures could go in her book?" Correct answers were followed by teacher comments designed to strengthen understanding of relevance terms.

The games used were lively table games. In one card game, Things That Fly Through The Air, the subjects in turn picked up cards from the table with the winner being the first player to pick up and identify a card with a picture of something that is airborne. When the subjects understood these language forms and could perform simple tasks based on these forms, sets of four concrete objects or pictures, three of which were clearly relevant and one clearly irrelevant, were introduced. The stories and games now required the subjects to select the objects that would be good for..., could be used for..., etc. At the same time, the irrelevance terms were used by the experimenter but were not taught directly, the rationale for this procedure was that prior familiarization under incidental learning conditions facilitates subsequent intentional training (Williams, 1970).

When the subjects were competent on the relevance aspect, that is, could respond accurately to relevance instructions, direct teaching on the use of irrelevance instructions was begun following the same general format of first learning the vocabulary (e.g., which of these things is no good for..., is something you do not need for..., does not belong with...). Stories, object and picture selection, and discussion were again used in teaching this vocabulary.

The training then proceeded on to stories in which three bits of information were relevant to the topic and one bit was irrelevant, the task being to identify the relevant or the irrelevant bits. Here is an example of the type of story used:

Bobby has a new two-wheel bicycle. He got the bicycle for his birthday. It is raining outside. Bobby's bicycle is red and yellow. Tell me all about Bobby's bicycle. Tell me something in the story that was not about Bobby's bicycle.

Next, the subjects were required to generate several relevant pieces of information about a given topic, then to generate one relevant piece, having first heard three relevant pieces about the topic. An example of the latter task is as follows:

Say, "Listen to this story: I like to go swimming. I like the cool water. I can swim fast." Pause, then say, "Tell me something else to put in my story. It has to be about swimming."

Finally, the subjects learned to listen to stories with one or more irrelevant pieces of information and identify them and to play games involving this skill. One game, Twenty Answers was a team effort in which a topic such as houses was put on the board and one team had a time limit in which to generate 10 relevant facts about houses and 10 irrelevant statements. As statements were written on the board this team identified but kept secret from the other team the irrelevant statements. The challenging team's task was to classify the statements as relevant or irrelevant. Points were earned by the first team for number of relevant and irrelevant statements generated within the time limit and for accurate identification of the irrelevant ones. The challenging team earned points for correct identification. The teams then reversed roles and were given a new topic. When the subjects were proficient in all of the above tasks they were given varied and extensive practice in identifying the relevant and irrelevant in a variety of contexts such as sets of tangible objects, picture sets of familiar topics, and verbal presentations such as role play interviews and school announcements. Toward the end of the training program classified advertisements from newspapers were frequently used to give practice in assessing relevance. Information that should and should not be given in emergency situations was also considered. In addition the subjects were required to generate sets of relevant or irrelevant information about supplied topics, generate topics for other children, assess the relevancy of others' responses, and give evidence of proficiency with the language of relevance-irrelevance.

Control Condition. The subjects in the Control group used similar story and game materials but were not given training related to the use of relevance-irrelevance instructions. The stories were incomplete stories with the children supplying endings that were sad, funny, happy, or surprising, followed by group discussion and evaluation. The games were table games of chance. The reasons for having the Control group participate actively included the necessity for ensuring that these subjects had equal practice in listening, discussing, and playing games; controlling for a possible contaminating influence of the Hawthorne effect; and ensuring that the number of prizes earned by the control subjects was equivalent to the number earned by the experimental subjects during the training period.

Posttraining Measure. One week after the completion of the six-week training program the pretraining measures were repeated.

Results

The results of this study provide strong support for the hypothesis that EMR children can benefit from formal training in the instructions used in relevant-irrelevant task discrimination. The analysis of covariance to test the significance of the differences between the Experimental and Control groups on the posttest showed that the Experimental group performed significantly better, having not differed from the Control group prior to training. Table 2 contains the pretest, posttest, and the posttest means adjusted for differences in the pretest means for the two groups.

TABLE 2

Pretraining, posttraining, and posttraining adjusted means for test performance

Group	Pretraining Mean	Posttraining Mean	Posttraining Adjusted Mean	F (1,37 dfs)
Experimental	11.25	18.75	21.41	14.99*
Control	13.70	14.35	15.01	

*p<.01

Following the recommendation of Glass, Peckham, & Saunders (1971) the level of significance of the analysis of covariance was reported at the .01 level. T-tests showed no differences on the pretraining means (t=1.01, dfs 38, n.s.) but marked differences on the unadjusted posttraining means (t=3.45, dfs 38, p<.001).

Discussion

Prior to training the subjects in both groups showed a marked deficit in ability to understand the instructional language used in presenting relevant-irrelevant discrimination tasks. However, with training the Experimental group showed marked improvement in understanding instructions, using them themselves in the training activities, and in performance on relevant-irrelevant discrimination tasks.

While the posttraining scores of the Experimental group showed marked improvement, the test performance of these EMR children was still far below that of nonretarded children of the same mental age (MA). When the two test forms used in the present study were administered to a group of kindergarten and first grade children (n=25) the nonretarded group achieved almost perfect scores. Of relevance here is a controversy concerning the cognitive functioning of mentally retarded as compared to nonretarded individuals. One group, the developmental theorists such as Zigler (1969), maintains that individuals differing in

rate of intellectual development as measured by IQ but equal in level of development as measured by MA will not differ in cognitive skills that are inherently related to IQ. The opposing group, the difference theorists such as Milgram (1973), contends that the mentally retarded will manifest inferior cognitive performance when compared to nonretarded individuals of the same MA. While the difference in test performance between the EMR subjects and the nonretarded primary grade children could be interpreted as support for the difference theoretical position, we could also attribute the poorer performance of the EMR group in part to an experiential deficit. Certainly, the program content and activities that we have surveyed in special education EMR classrooms over the past decade are consistent with this interpretation. Young EMR children are rarely given direct training in making relevant-irrelevant discriminations whereas children of average intelligence typically are provided with frequent practice in this cognitive process even at the kindergarten level. A difference in test performance cannot be construed as a genuine cognitive difference if the two groups differ markedly in test-related experience.

The evaluation of a training program must be concerned with the efficient transfer of new responses as well as with their acquisition. Generality of training is a function of both the breadth of content and activities used, and subject characteristics. One problem with EMR children is that they often tend to view newly acquired responses as situation specific and they lack the flexibility to apply their new learning in other settings. During the training period every effort was made to convey to the subjects that the skills being taught were applicable to other settings. To this end a large number of everyday experiences and events such as classified advertisements, school posters, signs, role play interviews, and incidents occurring in other classroom programs were considered within the relevant-irrelevant framework. No objective measures of transfer were obtained but there was subjective evidence in the form of unsolicited reports by teachers of the subjects' emphasis on relevance while teaching nonretarded peers a new game on the playground and while listening to an announcement from the office of the principal. The foregoing were two of many instances of transfer reported spontaneously by the teachers, who at this time were unaware of the focus of the training.

During the past decade several investigators have developed programs designed to improve the cognitive functioning of EMR children (Blackman, Bilsky, Burger, & Mar, 1976; Burger & Blackman, 1976; McIvor, 1972; Ross & Ross, 1974), the assumption being that with improvement in the cognitive processes there would be a concomitant gain in academic performance. In the case of the ability to make relevant-irrelevant discriminations of objects or information such an assumption appears justified. This cognitive skill is of critical importance in the acquisition of intentional training tasks in which both relevant and irrelevant factors are present and in test performance requiring the selection of relevant factors. However, there is another important benefit in the area of observational learning. It is our opinion that one reason why the EMR child so rapidly falls behind his peers of average intelligence in the elementary school years is that he is a poor

observational learner. Being able to distinguish the relevant from the irrelevant is essential for observational learning. Lacking both the ability to make this distinction and the mediational skills needed for coding (Bandura, 1969), the EMR child usually benefits only minimally from observational learning opportunities. Previous research on observational learning has demonstrated that under experimentally produced conditions of high motivation the young EMR child can identify and attend to relevant task components with a consequent improvement in performance (D.M. Ross, 1970; Ross, Ross, & Downing, 1973). With formal training in this cognitive skill the EMR child would be better equipped to benefit from the many observational learning opportunities that occur in naturalistic settings and which in the main are not characterized by unusual motivational conditions.

The present study is the first of a series designed to develop selective attention skills in young EMR children. The underlying assumption of this and previous studies (Ross & Ross, 1972, 1974) is that formal cognitive training for the EMR child should be begun at an early age, preferably in the preschool period, and programs should be developed systematically in sequential steps. The next step in this current series of cognitive training programs will be to teach the children to use instructional cues to identify a specific feature of the visual environment as the focus of attention and then to attend to that specific feature to the exclusion of others.

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APPENDIX B

Sample Lessons

Level F

Arithmetic Lesson 41
Memory Strategies Lesson 3
Vocational Lesson 6
Social Behavior Lessons 28-29
Art Lesson 27

Level G

Reading Lesson 10
Vocabulary Lessons 14-15
Problem Solving Lesson 2
Information Skills Lesson 8
Science Lesson 7

Level F

Arithmetic Lesson 41

Topic: Introduction to division.

Equipment: Articles that can be easily divided into two or more equal sections such as chocolate bars, papers particularly ones that are perforated so that sections can be easily detached, apples, soda crackers with clear divisions, and articles that cannot be easily divided into equal sections such as bananas, balls of clay, pieces of string, etc. Set of coins to one dollar.

Procedure: Talk about sharing, the concept of equal parts, the strategy of one person dividing the material to be shared and the other person having first pick, and methods of dividing such as folding into equal parts, measuring, weighing, having equal time at some activity, allotting equal time for some task, and parting your hair in the middle. Now get out all the coins from 20 nickels to two fifty-cent pieces and a dollar bill. Spend a lot of time talking about how you could divide a dollar between different size sets of children. Explain and demonstrate exchanging money so that it can be divided equally. Introduce the terms half, quarter, and tenths into your discussion.

Now talk about what it means to have half. Be very specific and use as many demonstrations as possible. Set out piles of coins and let the children quickly try to divide them into halves by inspection. Then count to see how accurate they were. Use a stopwatch to demonstrate a minute then have the children raise their hands when they think it's half a minute. Emphasize that when you divide something in half you are dividing it into two equal parts. Go over Arithmetic Seatwork 13. Show the children that geometric shapes can be divided by lines but sets of objects can be divided by circling subsets.

Memory Strategies Lesson 3

Start by talking about specific things or events that the children must remember and ask what procedures they use. Next, set out three familiar objects, let the children look at them briefly, cover them and ask what they were. Talk about how the children remembered them. Use praise. Play Kim's Game. In this game you set out a group of objects, have the children look at them, then have them hide their eyes. While their eyes are hidden you remove one object leaving all others in their original positions. Have the children open their eyes, raise their hands, and tell you what object is missing. Start with a small group of objects such as four. Demonstrate to the children how with a small number you could use rhythmic rehearsal to remember the objects, e.g., say "car, dog, box, watch" over several times, then have the children do it covertly if possible (if it is too difficult for them to say it covertly, have them whisper). Point out that if you can remember the whole set all you have to do when one is removed is say the set and you will know what is missing. Play the game several times. Use different objects each time. Give stars on score cards throughout the lessons

for good answers, winning the game, and good game behavior.

Remember that throughout this program you should modify the games, stories, and competitions to suit the ability of your group. If four objects is too difficult for your group to cope with in Kim's Game, use two objects. If four objects is too easy, use five or more objects. If the children find an activity difficult or clearly enjoy it but are not proficient at it you may want to repeat the lesson.

Read a story about forgetting. We have not located many books on this topic. The following books deal with some aspect of forgetting. It is likely that you will have to modify some of the books to make them suitable for your group. Some are more advanced books, others are picture books for young children which older children will enjoy. *An Anteater Named Arthur*. Bernard Waber. Boston: Houghton Mifflin, 1967. *Martha Matilda O'Toole*. James Copp. Scarsdale, N.Y.: Bradbury Press, 1969. *Mystery of the Missing Red Mitten*. Steven Kellogg. New York: Dial Press, 1974. *Forgetful Fred*. Jay Williams. New York: Parents' Magazine Press, 1974. *Forgetful Pirate*. Leonard Kessler. Champaign, Ill.: Garrard Press, 1974.

Vocational Lesson 6

Talk about allowances and what is involved in getting an allowance if this topic is relevant to your group. Now discuss salary and different salary arrangements such as pay by the month including pay for vacation periods, pay by the hour, and pay by the piece (paper boy). Discuss the advantages and disadvantages of each and point out that a paper boy usually is not supporting anyone so that pay by the piece and the possibility of fluctuations in that pay as customers leave is not a matter of great concern. However, for the father of six a steady income is a necessity. In any such discussion be sure to use specific examples of vocations, in this way you can build up the class' vocational vocabulary. At the same time it is easier for a child to think of the postman being subject to certain demands than it is for him to think of some undefined job's demands. Note that many high status jobs such as those of doctors or dentists are essentially pay by the piece jobs for the individual in private practice and as such have a high degree of risk at least at the beginning.

Social Behavior Lessons 28-29

28-29. Discuss conversation. It is unlikely that the children have any difficulty conversing freely with friends but how do they manage in the following situations:

(a) with a new child on the street whom they meet and do not know anything about.

(b) in a store when the storekeeper engages them in casual social conversation.

(c) when they meet another child's mother for the first time and are

suddenly left alone with her for a few minutes.

(d) at a birthday party dinner table when the children on either side are strangers.

(e) when they go to Sunday School for the first time and all the other children in the class are strangers but the child is positive that they must have some mutual acquaintances.

(f) when friends of their parents come to visit and they ask the child to tell them what he has been doing lately,

(g) when they go to summer camp or a summer resort and they see another same-age, same-sex child that they would like to talk to.

Use role-play and discussion to describe how you could handle these situations. Discuss the value of being at ease in generating conversation and the importance of being a good listener. After you have done some role play pick children and assign them parts and have them show you how they would manage in clearly-defined situations such as this one: You go out to play on Saturday morning and you don't see any of your friends around. Then a boy (girl) of your age comes down the street and says that he (she) is looking for John (Joan) Robertson because he (she) wants to play with him (her). You know that the Robertsons left suddenly a few days before for a vacation and you would like to play with this child. What do you say first and then what do you say and do?

Art Lesson 27

Painting - a crowd watching something.

Materials: One piece of 18" x 24" newsprint, a paint rag, an old saucer, and one bristle brush per child. For groups of four children, jars or tins of poster paint (red, yellow, blue, black, white), one jar of water, and two or three bristle brushes of different sizes such as a one-inch flat and a small round brush. One piece of paper pinned up for the teacher to demonstrate on.

Lesson: Discuss crowds and where and why they gather. What would various children in the class stop to watch on the street? Accident, fire, parade? For what events do people buy tickets? Baseball games, movies, circus. Where else might you see a crowd of people? Park on a summer afternoon, beach, ice-skating rink?

Before the children start, tell them that there are many many ways to start a picture and that you will show them one way that you would like them to try. While the children watch say that usually a person does not know how the whole picture will look when starting to paint so if you block in the picture with very light paint (show how to drop several brushfuls of clean water on your saucer and add a little blue or any other color to make a pale blue) you can change your mind as you go along (quickly paint in some circles and straight lines to represent people standing on a curb and some large rectanges to represent floats

in a parade. Now point out that if you do not like the way that looks, it will be easy to paint over it and change it - you might like to put in a tree and have some people in the shade (paint a tree over some of the people, still using the light paint). Rinse your brush and mix a green in the saucer. Paint a small part of the tree to show that the green paint easily covers the blue. Do all this as quickly as possible.

Have the class go ahead and paint starting with a pale color and blocking in their pictures. Explain that you just want them to try this way today and see if they like it.

Level G

Reading Lesson 10

Read Ethan's Favorite Teacher. This is a story about a boy who finds schoolwork boring but who has a very inquiring mind. The book shows clearly that patience and hard work can result in learning. Before you read it talk about practice, repetition, and stopping to think. Do not read it until your class is proficient at Tic-Tac-Toe. Most children know how to play this game. If your class does not know substitute one of the other stories and teach them before you read this one. Point out that it is very bad manners to call another child dumb-dumb. After you have read it ask the class what they did not like about Betty. Note that the teacher did apologize. Talk about the fallacy of the concept of dumb animals.

Vocabulary - boring, giving up easily, daydreaming, orangutan, opponent, furious, apology, electronic.

Vocabulary Lessons 14-15

Topic: Election Day.

Procedure: Talk about making decisions that affect everyone in the class. Use concrete examples such as time of recess or choice of story to be read. Ask the children when it is not only fair but also best for the teacher to make a decision and when it is not only reasonable but also desirable for the children to have some say in what should be done. The specific examples used here will depend on your school procedures, the kinds of decisions might involve such topics as what to teach in arithmetic, clearly a teacher decision because she is the expert and is also mainly responsible for the children learning numbers and what kind of Valentine's Day party to have which should be partly a decision of the children. Now discuss voting and when voting should be by secret ballot. Talk about peer pressure and popularity as determinants of votes. Now talk about what can happen if those who are entitled to vote do not bother to exercise their right. Give examples such as the Valentine's Day party for which one or two children have a very dumb idea that is not likely to be enjoyable. What happens if these children are the only ones who vote? What happens if everyone votes? Now set up some issues, let children express their opinions, and then have everyone vote by secret ballot on a form that states the issue, for example, "Do you want to have

a dress-up party at Halloween?" and provide spaces with "yes" or "no" for the child to mark as his vote. Now follow the same general procedure to elect a class president with a primary to select the final two candidates and then an election. Have campaign posters and speeches. In the process of carrying out these exercises establish that people in America have not always had the right to vote, women did not have the vote as soon as men, people in many countries still do not have the right to vote, secret ballots are the rule in American elections but not in those in some other countries, and voting is a privilege that could be lost if people are too indifferent about it.

Select one or two issues that are on the ballot in your community. Discuss the meaning of these issues and help the children to see the arguments for and against them. Now have the children think what their choices would be and close to the day of voting have them vote by secret ballot. Then see what the voters choose.

Note that General Election Day when a president is elected comes every four years on the first Tuesday after the first Monday in November. Every citizen of the United States who has reached the age of 21 has the right to vote. Distinguish between citizen and resident.

Incidental Vocabulary: vote, secret ballot, issues, candidates, campaign, funds, posters, majority, absentee votes, election, propositions, supporters, advertising, eligible, registered voter, president, political party, Democrats, Republicans, voting booth, marking a ballot, democracy, dictatorship, freedom, choice.

Information Skills Lesson 8

Teach Donkey. This is a lively game for five players. The object is not to be the Donkey, to avoid being a Donkey you must when the time comes pick up a counter from the center of the table. The procedure is as follows: Place in the center of the table one less counter than there are players. Use blocks or some other articles that are easy to pick up in a hurry. If there are five players use four blocks. Make up a score sheet with each player's name listed in a column. The game unit here is the set, a set is four of a kind such as four Jacks, four sevens. Pick out as many sets as there are players, for five players you need five sets. Shuffle the five sets thoroughly and deal them out one at a time, face-down. Each player will have four cards, probably all different. He picks them up and holds them in a fan in his hand. His task is to get four the same as quickly as possible.

Now, the exciting part starts. The dealer calls, "Go, Donkey, Go," and immediately everyone passes one of his cards to the player on his left and receives a card from the player on his right. This passing keeps up continuously with each player having to decide every few seconds what card to discard to the player on his left. The goal is to get four cards of the same denomination, that is, a set. As soon as someone has a set he yells, "Donkey" and grabs a counter, in this case a block. Everybody else grabs a block too, the one player who does not get one has a D put beside his name on the score sheet. Game #2 now begins.

The procedure is exactly the same, fast and exciting. The loser (player without a block) gets a D unless he was the one who had a D in Game #1 in which case he gets an O. Play continues until some unfortunate slow mover has DONKEY beside his name or until time is called. In the latter case the player with the most letters is the Donkey and all the other players point fingers at him and yell, "Hee-haw, Donkey."

Teach the game in this lesson and emphasize fast passing plus alertness to the call of "Donkey".

Problem-Solving Lesson 2

The topic is how a choice is made. We want to establish the bases for choice. Start by asking one child to tell you a vegetable that she likes and one that she does not like at all. Now ask her if her mother asked which would she like A (liked vegetable) or B (disliked), would she have a hard time choosing? Why? Encourage the children to verbalize their reasons for choosing one thing over another. In this case the basis for choice is clearly like/dislike. Follow the same procedure to establish that a two-choice or three-choice situation is easy when one factor is liked and the other factor or factors are disliked. Use TV shows, clothes, sports activities, and school subjects to establish that one basis for making a choice is liking and disliking.

Now use the same general approach to show that one basis for making a choice (a) in a store is what you can afford, i.e., a simple matter of money, (b) in a store is what you need, i.e., a matter of resources, (c) of an activity is how much time you have and how long the different activities take, and (d) of an activity is what skills are needed for the available activities and whether you have the requisite skills for some but not for others.

Examples of afford choices:

You have	You can buy
20 cents	candy bar or TV set or skateboard
2 cents	bubble gum at 2 cents or candy bar at 10 cents
25 cents	3 Musketeers bar at 20 cents or M & M's at 30 cents

Emphasize that each of the above choices involves a simple matter of money.

Examples of need choices:

If you have no socks, when you go to the store you should buy shoes, socks, shirt, or pants. Choose only one.

If you tear a page in your book and you have no tape to mend it, when you go to the store you should buy candy, ribbons, tape, or soap. Choose only one. Emphasize that this is a choice of resources.

Examples of time choices:

During recess you can play jumprope, play dodgeball, or talk to friends. Why can't you do all three in 15 minutes? Why is it best to do just one?

At 4:30 p.m. when you have to be home at 5:00 p.m., would it be better to watch a short TV program or go to a movie or go swimming? Why? Emphasize time limitations.

Examples of skills choices:

Would you choose (a) driving a car or riding a bicycle, (b) cooking a whole dinner for 12 or getting some milk and cookies for your friends, (c) flying a passenger plane or skateboard riding, and (d) going to school or going to the office. Emphasize importance of having essential skills for activity you choose.

Science Lesson 7

Point out that a factory is made of a group of materials. Ask what materials. Now ask what the body is made of. Explain that it is made of cells, that cells are like tiny packages of living material and that they need food to stay alive. Draw pictures of some cells on the board to demonstrate that the body cells are of many kinds, sizes, and shapes. Bones are made of one kind of cell, muscles are made of another kind, and skin and blood are made of still other kinds of cells. It would really help at this point to have good colored pictures of a variety of kinds of cells and to show the children some stained blood cells and other kinds of body cells under a microscope. Emphasize the size of cells with examples such as 1-1/2 million red blood cells spread out in a single layer would cover only your little fingernail. To give some idea of how a microscope magnifies show the children a piece of hair and them put it under the microscope. Point out that body cells are rather like workers in a factory and that the brain which is also made up of cells is like the executive group. Like the workers the cells all have different jobs which they are good at and by having many different kinds of cells each of which does one kind of job the body, as a rule, functions smoothly.

APPENDIX C

Summaries of Lesson Content for Levels F and G

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ARITHMETIC

Level F

Addition: Four column addition with carrying more than once in a problem. Adding numbers and zeroes as well as zeroes and numbers. Checking procedures. Mental arithmetic with sums to 99, no carrying. Addition problems requiring use of dollar sign and decimal point. Increasing emphasis on speed, computation accuracy, and on accuracy in copying. Language of addition story problems. Place value to four figures. Concept of thousand.

Subtraction: Four column subtraction with one regrouping required in a problem. Subtracting numbers from zero and zero from numbers. Checking procedures. Mental arithmetic with remainders to nine, no borrowing. Subtraction of money. Language of subtraction story problems.

Multiplication: Multiplication facts for 0X table to 10X table. Two-place multipliers and two-place multiplicands (11 only) in vertical position problems. Commutative value of multiplication. Checking procedures. Multiplication problems expressed as addition problems.

Division: Understanding of concept of division. Non-numerical ways of dividing. Relation of division to multiplication. Division facts for $2 \div 2$ up to $20 \div 2$, $3 \div 3$ up to $18 \div 3$, $4 \div 4$ up to $24 \div 4$, $5 \div 5$ up to $50 \div 5$, $6 \div 6$ up to $30 \div 6$, and $7 \div 7$ up to $42 \div 7$. Checking procedures. Remainders. Vertical and horizontal positions. Concept of average. Determining the average. Simple story problems. Meaning of division sign.

Time: Time by the minute. Use of A.M. and P.M. Addition and subtraction of time. Converting minutes to hours and minutes. Calendar.

Money: Absolute value of coins to one dollar. Giving change to one dollar. Exchange of coins.

Counting: Emphasis on skill and speed in rational counting. Rote counting by 1's, 2's, 3's, 5's, 10's and 11's.

Measures: Time, weight, distance, and liquid measures. Use of nonmetric and metric terms. Reason for use of metric terms. Common measuring instruments.

Fractions: Concept of fraction. Use of terms numerator and denominator. Denominators of 2 to 5, numerators of 1 or more. How to find a fraction of a group. Ability to explain meaning of a fraction in terms of tangible objects.

Level G

Addition: Addition of fractions with common denominators and easily converted unlike denominators. Additon of numbers with decimals and dollar signs. Procedure for finding unnamed addends. Four column addition. Zeroes. Carrying.

Subtraction: Finding unnamed subtrahends. Subtraction of money. Checking procedures. Four column subtraction. Zeroes. Borrowing.

Multiplication: Multiplication tables from 0X table to 12X table. Vertical multiplication with 10 and 11 as the multiplier. Checking procedures.

Division: Division facts for 8, 9, 10, 11, and 12. Long division with remainders and 2-place divisors. Rules for determining whether numbers are divisible by a given divisor.

Time: On the minute. A.M. and P.M. Converting seconds to minutes, minutes to hours, hours to days.

Money: Practical applications such as budgets, interest, averages, profit, loss, bank accounts, sales.

Counting: Rote counting by 12's. Quick accurate rational counting by 1's, 2's, and 5's.

Measures: Practical use of measures such as mail rates, body weight, and temperature. Metric and nonmetric terms.

Fractions: Reading fractions correctly. Changing to common denominators. Addition of fractions. Reduction procedures. Use of fraction terminology.

Decimals: Meaning of decimals. Accurately describing units and tens in decimal numbers as $\frac{\ }{100}$ or $\frac{\ }{10}$. Addition, subtraction, and multiplication.

Roman Numerals: Concept of different number systems. Roman numberals 1 to 12 plus 50 and 100.

Estimation: Of reasonableness of answers, probable range of answer. Logical approach to assessing accuracy of computation.

Problem-Solving Strategies: Description of steps in solving story problems that require two or more operations.

Graphical Presentation of Information: Introduction to pie graphs, pictographs, and line graphs.

READING

Level F

Reading: In the Bank Street Readers the best children in your group will finish My City which is the first book of the second reader in the series. Different kinds of reading such as part-taking are used. Competitions are used as a motivating procedure to encourage children to work on reading fluently, accurately and with expression. Supplemental reading activities include ten reading sheets that are a continuation of the Hilltop City series that began in Level D.

Reading Comprehension: Activities are provided that give practice in reading comprehension with an emphasis on sentence-length answers. At this level the child is expected to read simple directions.

Test-Taking Skills: Vocabulary review tests, sentence completion using a multiple choice format, simple questions based on prior reading requiring written or oral answers, and true-false questions.

Review and Increased Practice: Rhyming words. Contractions. Quotation marks. Exclamation marks. Plurals. Verb endings. Writing stories. Initial and end consonants.

Vocabulary Building: Increased emphasis on definition of words, using words in sentences to show meaning, and thinking of other words with similar or identical meaning. Word building on regularly spelled three letter word base.

Independent Study: Word Lists. Silent reading assignments. Emphasis on practicing reading smoothly and with expression.

Level G

Reading: In the Bank Street Readers the best children in your group will finish Green Light, Go which is the second book of the second reader in the series and will begin City Sidewalks which is the first book of the third reader in the series. Increased emphasis on independent, silent reading of easy-to-read books. Fluency and expression are required in oral reading. Supplemental reading activities include ten reading sheets of the Hilltop City series.

Reading Comprehension: Emphasis on reading for information and reading directions. Written directions are used on work recognition tests. Distinguishing between fact and fantasy.

Test-Taking Skills: Vocabulary review tests, sentence completion, multiple choice, and true-false questions. Speed tests.

Review and Increased Practice: Comparative endings. Verb endings. Contractions. Rhyming words. Compound words. Quotation marks. Exclamation marks. Plurals. Initial and end consonants. Short vowel sounds.

Vocabulary Building: Sets of words describing mood, color, movement, and others. Opposites. Increased emphasis on clear definition and showing understanding of meaning by using words in sentences. Synonyms. Word building on three-letter word base. Using the table of contents.

Independent Study: Word lists. Silent reading assignments for class report.

VOCABULARY

Level F

The major goal of this program is to acquaint the child with the functions and sections of the daily newspaper. Other topics covered include institutions, public utilities, and taxes.

Newspaper: Delivery, vendors, sections of daily paper, types of news and editorials, columns, special features, editions, cost.

Stores: Personnel, types of merchandise, security, sales, financial arrangements such as accounts. Also restaurants.

Hospital: Function, personnel, structure.

Entertainment: Mass media, theaters, concerts.

Banks and Income Tax: Emphasis on services in banks and reason for taxes. Followed by schools, libraries, and roadways.

Level G

The major goal of the program is to provide the child with an understanding of the meaning of holidays. Most of the holidays are national ones, a few are religious. The program also includes lessons on familiar economic procedures and events.

Holidays: Includes Labor Day, Yom Kippur, United Nation's Day, Halloween, Election Day, Thanksgiving, Human Rights Day, Hannukah, Christmas, New Year's Day, Groundhog Day, Lincoln and Washington's Birthdays, Valentine's Day, St. Patrick's Day, Easter, Independence Day.

Economic and legal arrangements: Contract, fund-raising events, rent, cost of services, sales, insurance, reservations, taxes, payment arrangements, guarantee, forms, coupons.

SPELLING

Level F

Study habits: Learning how to learn to spell is emphasized.

Words: There are seven word lists containing a total of 210 words. Words from Level E are relearned and the spelling of many regularly-spelled words is introduced incidentally.

Games and other activities: Used regularly to give the child a sense of competence concerning his ability to cope with spelling tasks. Includes crossword puzzles, jumbled words.

Level G

Words: There are eight word lists containing a total of 80 new words and 25 additional new words are introduced as words of the day. The word lists from Level F (total 210 words) are relearned and the spelling of many regularly-spelled words is introduced incidentally. The reading and writing programs supplement the spelling program.

High frequency words: The goal here is to establish a high level of reading, spelling, and writing competence with these words.

Games and other activities: Used regularly to provide rapid review and also to introduce words that are relatively new to the child's vocabulary. Includes crossword puzzles, jumbled words, and missing words in sentences.

WRITING

Level F

Utility of writing, inconveniences of not writing well. Writing posture. Practice in evaluating own work. Competitions among the class; with oneself. Cursive writing review and practice: upper and lower case letters, copying words, paragraphs from chalkboard, taking dictation, improvement in speed through elimination of bad habits such as long pauses between letters. Printing review and practice: upper and lower case letters, when printing is essential, e.g. application forms, kinds of printing, e.g., books, newspapers, signs.

Numbers, addresses, signatures: on letters, when to sign whole name, first name; and dates, witnessing signatures, wills; initials, monograms. Writing checks. Application forms: understanding the instructions and completing simple forms. Planning and printing notices and signs. Writing letters. Postcards and space restrictions.

Level G

Quality: Consideration of good, average, and poor writing. Importance of legibility. Comparisons with writing of older children. Common faults. Mail delivery and legibility.

Activities: Copying, making signs, assembling a class paper, writing postcards and letters, writing and printing competitions.

Printing: Importance in signs, reason for variety of size in signs, use in comic strips and cartoon captions. Size vs. underlining.

Speed: Increasing emphasis on speed. Competitions emphasizing speed and legibility.

Importance of writing and printing: Why writing is important in our life style. Adults who cannot write. Use of underlining. Reporting. Advertising.

SCIENCE

Level F

Plants: Direct experience with and demonstration specific stages of plant growth. Specialty crops.

Weather: Overview of types of weather within the context of the seasons. Concepts of climate and solar heating, air and air movement demonstrations, interdependency of plants and animals (oxygen and carbon dioxide).

Human Body: Overview of the routine physical and why it is important. Topics include check-up, symptoms, emergency, routine, and names of instruments such as stethoscope. Food and exercise needs for a healthy body. Shots, antibiotics, and vaccination. Diets and overweight.

Environment: Physical characteristics, manmade characteristics, conservation, reforestation, soil erosion, ecology, waste, and pollution. What the individual can do. Air and other kinds of pollution such as litter and noise.

Level G

The purpose of the unit is to give the child a working knowledge of the human body. Analogies are drawn between the body and a factory. Role of the brain is emphasized throughout.

Skeletal-muscle unit: Role of muscles and bones. The cell. Effects of training. Concept of balance. Joints. Fractures.

Growth: Conception and birth may or may not be covered. Rate of growth in infancy, childhood, and adolescence. Role of food in growth. Protein, fat, and carbohydrates. Energy. Vitamins. Minerals. Calories.

Digestion: Digestive tract. Process of digestion from ingestion to elimination.

Circulatory System: The heart as a pump. Blood. Transfusions. Red and white blood cells and their primary functions. Bacterial invasion of body. Germs. Viruses. Antibiotics. Oxygen.

Sensory Apparatus: The senses. Nerves. Common sensory deficits such as visual and auditory problems. Range from mild to severe.

Maintenance of good health: Common cold. Cuts. Fractures. Common contagious diseases. Symptoms. Body temperature. Role of doctor. Common laboratory tests and other medical procedures. Common sense discussion of topics such as rest, safety, surgery, and vaccination. Concepts of acute and chronic illness and good health.

LISTENING

Level F

Message-taking skills. Digit span: phone numbers, car licenses, addresses, dates, etc. Rhyming skills: strategies for word selection. Listening for details. Sequencing: of physical movement, assembly of objects, story events. Following directions: assembly tasks, games, exercise routines, classroom monitor tasks. Rhythm perception: discriminating between different rhythms and moving accurately to them. Auditory recognition of others' feelings. Completing sentences.

Level G

Attention: The goal of the program is to teach the children to listen, maintain attention, give accurate information, and use information effectively.

General game skills: The program is presented within the context of games and the children are expected to be proficient at the following general game skills: playing in turn, playing briskly, taking only one turn, handling game materials only at appropriate times, handling game materials carefully, being a good loser and a graceful winner, observing the specific rules of a game willingly, accepting the referee's decisions with good grace. They also learn card skills such as dealing, shuffling and cutting.

Specific game skills: Concentration, Rummy, Twenty-One, Whist, Old Maid, Tic-Tac-Toe, Hearts, and Donkey.

Strategies: Effective strategies are emphasized. Role of chance is discussed. Team play strategies are introduced within the context of four-person games.

Card tricks: Concept of trick. How some familiar card tricks are done.

MEMORY STRATEGIES

Level F

Concept of remembering: Good and poor memory. Effects of failure to remember. Unusual examples of good memory. Rewards for good memory.

Rehearsal: Situations in which rehearsal is appropriate. Use of rehearsal in game situations. Rhythmic rehearsal with letters and digits. Rote repetition.

Place memory: Methods for remembering regularly and irregularly placed objects in games. Place memory in practical situations such as school lines and desk location.

Associative memory: Common methods of remembering paired associates such as sentential strategies, rhymes, and imagery especially interaction imagery.

Sequencing: How to remember sequences.

Strategies in general: When to use them.

Level G

Memory strategies: When to use them. Review of rote repetition, rhythmic rehearsal, place memory, sequential memory, and verbal mediation techniques such as generating rhymes, placement of words or events to be associated in sentence contexts.

Application of memory strategies to familiar games: Emphasis on which strategy is appropriate. When not to use a memory strategy.

Use of lists: How to compile and use a list. When a list is preferable to a memory strategy. Appointment books and other mechanical memory devices.

Common memory tasks: How to memorize rhymes. Use of memory in a play. Importance of remembering rules.

PLANNING

Level F

Methods of planning: Making lists, using timetables, having budgets, drawing plans, group planning by committees.

Social situations requiring planning: Inviting a friend to your home - for lunch, to do homework. Parties - buying a present, group contributions for a single present. Visiting a sick frined at home, in hospital. Lunch in a restaurant.

Appointments: Doctor, dentist. Getting to a destination on time - on foot, by public transportation. Taking an animal to the veterinarian.

Cleaning: The house, classroom, yard; household chores, difference between cleaning and tidying.

Buying goods or services: Shopping at several stores, planning route, taking the bus. Returning goods to a store, including relevant vocabulary (e.g., refunds, credit slips, guarantees). Buying new shoes, sports equipment. Getting a haircut. Sending away for a free sample. Sales: General store sales, library book sales, garage sales, class sale. Trading post: purchases made by exchange of goods, not money.

Money: Ways to make money. Allocating money for Christmas presents. Delivering notices or newspapers, including route planning.

Contests: Entering a magazine contest, a sports day competition, a scrapbook contest. Raffles.

Special events: A game session, an entertainment, showing a movie, a picnic, a day at the beach, going to a parade, a fashion show.

Special-day activities: Halloween, Valentine's Day, Easter egg hunt.

Other: Class mural, class library, a toy collection project, building a tree house, planting a garden.

Level G

Concept of planning: Why plan? Advantages of planning. Importance of realistic planning. Logic of planning. Importance of flexibility. Coordinator's role. Last-minute plans. Emergencies.

Concrete examples of planning: Budgets, planning meals, people who must plan ahead such as store buyers, teacher planning, timetables, moving.

Planning activities: A day at the park, sandwich sale at recess, hike or field trip, how to spend Saturday. Halloween activities, white elephant sale, fall fair, social entertainment, outdoor cookout, birthday party, field trip to museum, vacation, picnic, Easter-egg party, garage sale, and surprise party. Emphasis on realistic approach of costs for sales.

PROBLEM SOLVING

Level F

General: What a problem is, kinds of problems. Scarce resources, including time and money, and high usage strategies (compromise, take turns, draw lots). Multiple alternatives, deciding between attractive alternatives.

Strategies: Finding a lost article and animal. Estimating amounts. Settling an argument. Wanting to make up after a fight with a friend. Handling having things stolen. Phoning someone when you lack complete information. Remembering things.

Other problems: Handling emergency situations; when someone is hurt in an accident. Being blamed for something you have not done. Crowded living conditions. Being forced to move from your home. Bad dreams. Embarrassing clothes. Finding the way to and from a given destination. Nicknames, teasing, and bullying. Being new in the neighborhood. Returning home with the wrong article. Taking on more than you can handle (e.g., starting many things but never finishing them).

Level G

Concept of choice: Order vs. choice. Importance of flexibility - weighing the alternatives. Philosophical acceptance of consequences.

Bases for making a choice: Like vs. dislike, what you can afford, what you have time to do, what skills are needed for alternative activities. Choosing between several attractive activities - deciding factors include limited opportunity, feasibility, having requisite skills, consideration for others' feelings - Choosing between several unattractive alternatives - time factor, possible fringe benefits of a specific choice, and location of job.

Specific choices: Choosing between several sources of information, alternative actions following property damage, alternatives in an emergency, choice when resources (food, money) are scarce, choice of clothes, activities, membership.

Choice in game activities: Strategies and probabilities as basis for action in Twenty-One and Tic-Tac-Toe.

SOCIAL BEHAVIOR

Level F

Utility of social rules, understanding meaning of terms such as courtesy, good manners, polite. Concern for rights of others, of animals; cooperative behavior in public places, at home, at school; in service places (e.g., dentist). Appropriate behavior in stores, restaurants, as an audience, on school bus. Concern for public property.

Reciprocation: Gift-related behavior, of invitations. Borrowing, trading, giving, and related responsibilities. Helping others and being helped. Punctuality.

Social interaction: Conversation (e.g., appropriate topics for specific situations). Welcoming newcomers, responsibilities to and of neighbors; friendship and its responsibilities; introductions. Clubs and arranged groups.

Promises, secrets, surprises; apologies; asking questions - when to and what is appropriate; winning and losing graciously. Envy, jealousy, perception of others' feelings and behaviors. Frustration.

Emergencies; working mothers; divorce, adoption. Renting equipment and houses; vandalism.

Accepting deviations from the physical norms - without staring; unkind remarks about self and others.

Level G

Tests of social skill are presented using the context of letters to a columnist: the children say how they would handle the problem described in the letter, then listen to and discuss how it was answered in the column. Topics covered include: sharing a bedroom with a sibling, responsibilities around the house, fear of the dentist, friends who cheat in school, who lie; shoplifting, vandalism; punctuality, keeping promises by children, by adults; good grooming, marked dislike of school or family activities, awkwardness about compliments, envy and jealousy, ashamed of own house, of own parents; teasing, responsibility for getting oneself up, manners and how to acquire them, the right to privacy, to spend allowance freely, accidental damages, letting someone know you like them, stage fright, racial prejudice, accepting invitations, shame about divorce, ownership and sharing, fear of going to camp alone, disliked gifts, responsibility when you find something; smoking, drinking and drugs; gossip, overhearing something you should not have heard.

VOCATIONAL TRAINING

Level F

Occupations: Police, truck drivers, fireman, delivery services, farmer, factory worker, door-to-door selling, school personnel, office jobs, construction, assembly-line worker.

Job-related attitudes, concepts, and behaviors: Courtesy, responsibility, punctuality, dependability, volunteer, reputation, references, experience, interview behavior, strikes.

Salary-related terms and procedures: Full-time, half-time, part-time, profit, loss, money-making schemes, deductions, unemployment insurance, taxes, salary vs. allowance.

Work skills: Practical experience in cleaning service. Good work habits are stressed.

Level G

Work-related concepts: Providing services vs. tangible goods, professions, work chains, disruption of work chain by strike (deliberate) or by weather (accidental), interdependence of job. Advertising.

Specialization: Examples of specialists in a variety of professional, white-collar, and blue-collar fields. Advantages and disadvantages.

How to get a job: Advertisements, applications, references, qualifications, salary, hours, other practical considerations. Role play of job interview.

Jobs children can do: Baby-sitting, dog walker, garden work, paper delivery, and part-time store work. Discussion of qualifications needed. What children in this class could be.

Money-related concepts: Budgets. Salary vs. income. Allowance. Commission. Taxes.

Occupations: Police, fireman, doctor, hospital job, truck driver, managerial job, farmers, door-to-door selling, veterinarian, supermarket and restaurant personnel, concept of occupation including terms such as housewife and student. Working mothers - advantages and disadvantages to family and to mother. Messenger services. Problems of being the boss.

Terminology: Job satisfaction, strike, absenteeism, shift, moonlighting, fringe benefits, reputation, assembly-line, hours, time-clock, division of labor, interview, business letters, friendly letters, typed letter.

LIBRARY ORIENTATION

Level G

Types of library: Public, private, and lending. Their functions and rules. Source of support.

Books: Fiction vs. non-fiction. General categories of non-fiction. How to choose a book.

File: General file skills. General understanding of Dewey Decimal System of Classification.

Library concepts: Call numbers, renewal, reserve, fines, card catalog, class numbers, title cards.

HOUSEHOLD SKILLS

Level G

Introduction to cooking with an emphasis on function of kitchen utensils, good cooking techniques, safety rules, sanitary procedures, and kinds of foods that are available. Recommended recipes include simple bread recipes such as varieties of toast, common beverages, simple egg dishes, quick meat dishes, and easy desserts.

ART

Level F

Painting: A variety of topics drawn from the children's own experiences. Concept of lightly blocking in a picture so that changes can be made. Characteristics of paint: wet colors against wet, adding white or black to colors - opaque, thinning colors with water - transparent, - general color mixing. Paint combined with crayon for details. Crayon with paint wash. Chalk painting with emphasis on mixing colors.

Drawing: With ink on wet and dry paper. Still life and pictures.

Papier maché: Puppet heads, bowls, animals, necklaces, masks.

Sewing: Puppet clothes, burlap wall hanging with knotted and pulled threads and stitching, Christmas stocking.

Paper sculpture: Paper windmill, snowflake mobiles, 3-dimensional forms, cut-fish mural.

Clay: Tiles with underglaze and clear glaze.

Terrariums, Tie-dying: Paper for wall-hangings, calendars, cards.
Printmaking: Bean prints, rubbings from textured objects.

Level G

Craft activities, some of which are directed toward a school fair: clay - pots, figures, animals, tiles, tile mural, wind-chimes; use of underglaze, slip, clear glaze; sewing - burlap wall hanging, place mats, Christmas stocking; tie-dying - wall-hanging, t-shirt, calendar; papier maché - masks, bead necklaces, puppets; paper sculpture - snowflake mobile.

Painting and related activities: Using topics within the children's own experiences. Skills include blocking in lightly to permit later changes, mixing colors (opaque and transparent colors). Activities: picture painting,

finger painting prints, chalk on wet paper, chalk and paint, murals, ink drawing, from posed figure; collage on scrim.

Field trip: To a gallery if there is an exhibit appealing to children.

MUSIC

Level E

Song experiences: Systematic development of a repertoire of familiar and popular song favorites. Concept of hit parade. Emphasis on good singing. Competitions.

Square dancing: Review and extension of square dance basic movements and calls. Development of a repertoire of widely-used square dances.

Social dance: Instruction in contemporary dance. Types selected depend on community practices. Competitions.

Audience behavior: Concert attendance skills, terminology, and audience behavior.

Instrumental interpretation: Emphasis on use of instruments to convey mood, suspense, and action.

Level F

Song experiences: Continued development of a repertoire of old favorites and current hits. Selective assignments to listen to television song programs. Emphasis on good singing. Contests.

Square dancing: Review of dances used in previous levels. Introduction of more difficult dances and movements.

Social dance: Contemporary dance taught depends on community practices. Peer teaching of dance forms.

Audience behavior: Orientation to school orchestra. Audience behavior.

Level G

Song experiences: Continued development of good singing and a repertoire of songs that will facilitate peer group interactions. Introduction to school choirs and barber shop quartets.

Square dancing: Development of square dance skills. Introduction to more difficult dances including folk dances.

Social dance: Contemporary dances taught in part by peer teachers.

New musical forms and experiences: Guitar music, operettas, folk festivals, rock concerts, and traditional concerts. Selected television assignments. Classroom concerts.

PHYSICAL EDUCATION

Level F

Physical fitness: Simple exercises; fitness tests; concept of norms, of stamina, of self-improvement; homework.

Posture: Stress on correct standing and walking positions.

Games: Baseball and variations, dodgeball and strategies, beginning volleyball skills, general characteristics of team games involving goals, marble games, tag games, kick the can, Run, sheep, run; jumprope - single and double ropes; local games - selected from those that are popular within the school and neighborhood.

Dancing: Square dancing, waltz steps, mixer skills.

Track meet skills: Relay races with several tasks per turn, individual and pair races, other relays - beginning broadjump and highjump skills, obstacle courses: timed.

Target throw: baseballs, beanbags, darts.

Balance skills: On one foot, along a line, along a board, hopping, eyes closed.

Competitions: Individual and team in most of the above activities, concept of challenge ladders, for example, after a competition a child can challenge the child who ranked immediately above him for his spot.

Leadership in games: Being able to decide what to play, then establish the rules and run the game.

Level G

Simple fitness: Exercises, tests at intervals, norms.

Games: Including baseball, dodgeball, and volleyball; balance activities (roller or ice skating, skateboards, bicycle riding) all preceded by demonstrated proficiency in related balance skills.

Trackmeet skills, miscellaneous games including those popular at school at recess.

Dancing: Waltz, square dancing, fox trot, cha-cha-cha.

Spectator behavior: Understanding of the game being watched (e.g., how a scoreboard works). Possible sports to choose: basketball, soccer, figure skating, competitive swimming.

FRIDAY FUN AND GAMES

Level F

Individual and Team Competitions: Indoor and outdoor active games and hunts such as scavenger hunts; Easter-egg hunts, and treasure hunts.

Role Play: By individuals in the class and by sixth-grade pupils on specified topics. Charades.

Library Visits: General orientation to the library. Story focus.

Holiday Parties and Concerts: Class planning of events. Individual competitions at major events such as fairs.

Table Games: Emphasis on developing skill in popular games. Teaching of strategy for two-person games such as Tic-tac-toe and team games such as Twenty-Questions. Games of chance.

Movies: Criteria for selection and sources are provided.

Class Choice: Vote for activity to demonstrate acceptance of majority decision.

Level G

The theme is the mass media. The children are given a series of experiences with books, films, radio programs, television and live performances. One goal is appreciation, such as appreciation of poetry. Another goal is critical selection of media experiences. A wide range of television experiences such as games of chance, team competitions, news broadcasts, and interviews are provided.

Holiday Parties and Activities: Several are included to provide planning and holiday celebration experience.